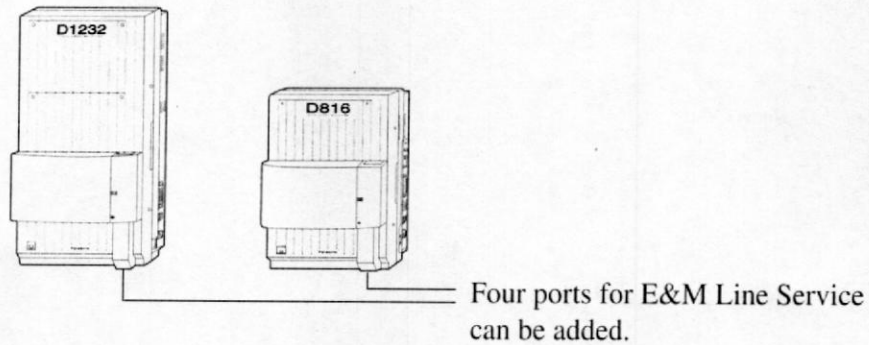


Introduction

This unit can be used for E&M Line Service and has four ports.



Specifications

- (1) E&M (TIE) Line Types Type 5 only
- (2) Transmission 2-wire or 4-wire voice path (Programmable)
(Note) Maximum cabling distance of the E&M line cord (twisted cable):
22 AWG: Under 9.6 km
- (3) Transmission levels
2-wire voice path -3 db (transmit/receive)
4-wire voice path -3 db normal (transmit/receive)
Programmable (-6 db, -3 db, 0 db, +3 db)
- (4) Signaling DTMF or Pulse
- (5) E lead
Battery -48 VDC, 20 mA to ground (max.)
Sensitivity 5 mA or 2000 Ω to ground (max.)
(min.)
- (6) M lead
Available current : 30mA (max.)
Available voltage: $\pm 100V$ (max.)

Introduction

The unit can be used for 12.7/13.2/13.5 and 14.0 inch ports.



From front view, 12.7/13.2/13.5/14.0 inch ports can be added.

Specifications

- 1. Port size: 12.7/13.2/13.5/14.0 inch
- 2. Port material: Stainless steel
- 3. Port length: 12.7/13.2/13.5/14.0 inch
- 4. Port width: 12.7/13.2/13.5/14.0 inch
- 5. Port height: 12.7/13.2/13.5/14.0 inch
- 6. Port weight: 12.7/13.2/13.5/14.0 inch
- 7. Port volume: 12.7/13.2/13.5/14.0 inch
- 8. Port surface: 12.7/13.2/13.5/14.0 inch
- 9. Port finish: 12.7/13.2/13.5/14.0 inch
- 10. Port color: 12.7/13.2/13.5/14.0 inch

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Feature Descriptions

E&M (TIE) Line Service

Description

An E&M (TIE) line is a privately leased communication line between two or more PBXs, which provides cost effective communications between company members at different locations. The TIE lines can be used to call through your system to reach another switching system (PBX or CO). By utilizing TIE lines, your system can support not only communications with the public network but with other company locations in the private network where your system is included.

System Explanation

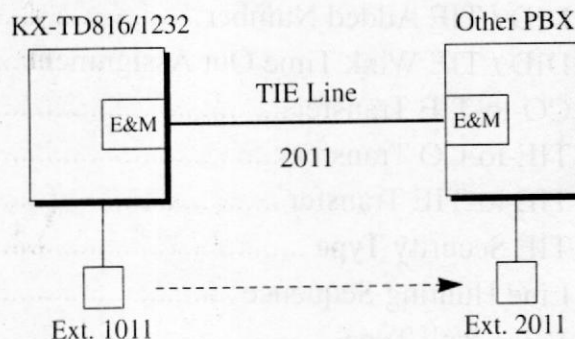
1. Making a TIE Call

One of the following two methods can be used to make a TIE call.

1.1 Extension Number method

Dial the [Extension Number] only to make a TIE call.

<Example>



Explanation

To use this method, it is necessary to change the first one or two digits of extension numbers of either PBX to avoid having the same extension number.

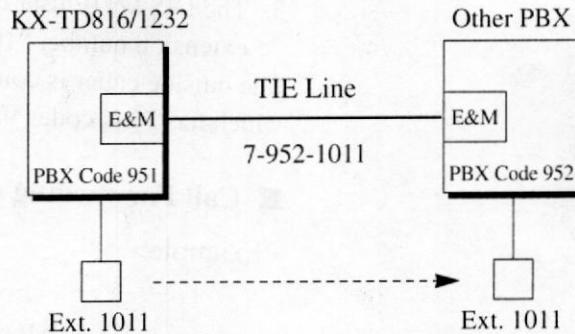
1. Extension 1011 dials extension number "2011".
2. Extension 1011 is connected to extension "2011" of the other PBX.

Feature Descriptions

1.2 PBX Code method

Dial the [TIE Line Access Code] [PBX Code] [Extension Number] to make a TIE call.

<Example>



Explanation

To use this method, it is necessary to have each PBX code in order to identify the location of an extension.

1. Extension 1011 dials TIE line access code "7", PBX code "952" and extension number "1011".
2. Extension 1011 is connected to extension 1011 of the other PBX which has PBX code "952".

2. TIE Line and CO Line Connection

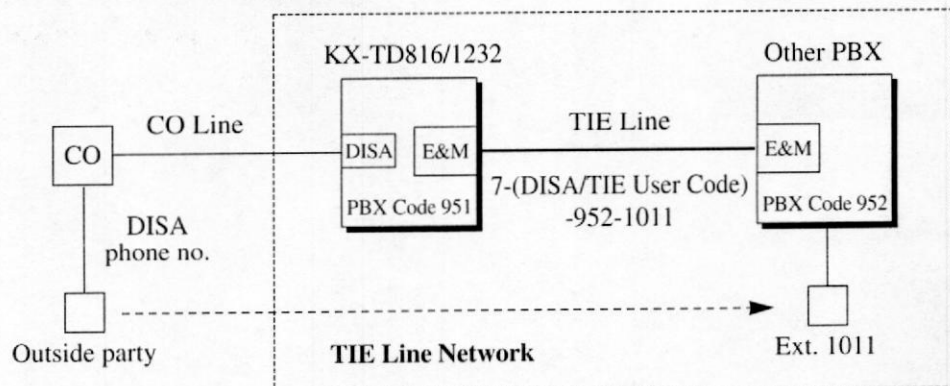
To connect the TIE line with the CO line, the following patterns are available.

2.1 CO-to-TIE Transfer

The system transfers incoming outside calls to the other PBX through the TIE line. The following patterns are available.

■ TIE call using DISA

<Example>



Feature Descriptions

Explanation

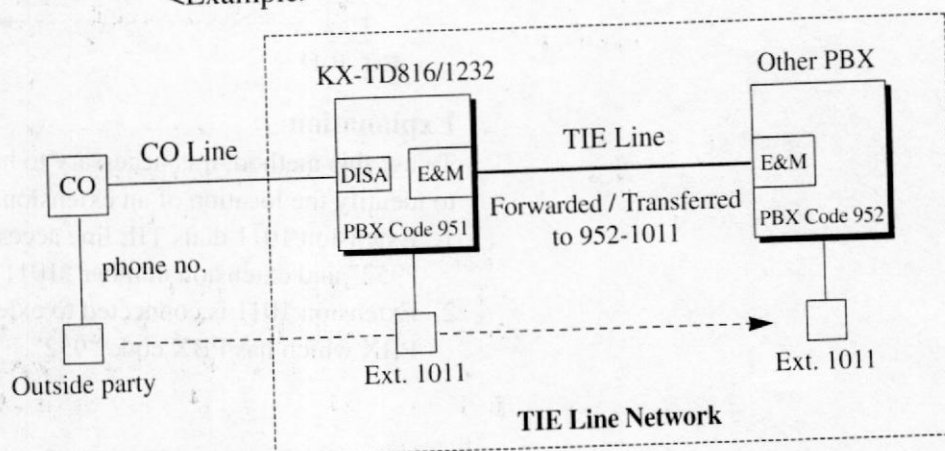
The outside caller dials as follows:

1. The DISA phone number, and the DISA-OGM is sent.
2. TIE line access code "7", and a dial tone is heard.
3. The DISA/TIE user code (if required), PBX code "952" and extension number "1011".

The outside caller is connected to extension 1011 of the other PBX which has PBX code "952".

■ Call Forwarding / Call Transfer to the TIE line

<Example>



Explanation

The outside caller dials the phone number, and the call is forwarded or transferred to extension 1011 of the other PBX which has PBX code "952".

Note: Setting the destination of Call Forwarding to the TIE line is the same as Call Forwarding to a CO Line.
Transferring a call to the TIE line is the same as a Call Transfer to a CO Line.

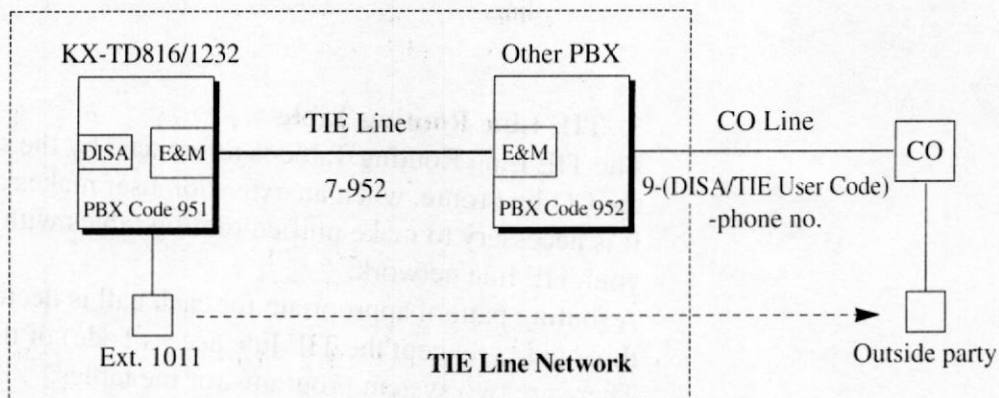
Feature Descriptions

2.2 TIE-to-CO Transfer

The system transfers TIE calls to the CO line of the other PBX through the TIE line. The following patterns are available.

■ Outside call through the other PBX

<Example>



Explanation

Extension 1011 dials as follows:

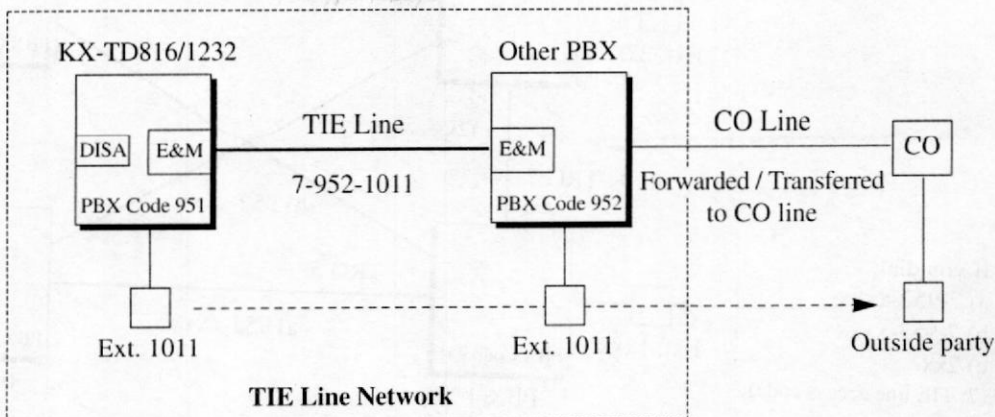
1. TIE line access code "7", PBX code "952" and CO line access code "9", and a special dial tone is heard.
2. The DISA/TIE user code (if required) and desired phone number.

Extension 1011 is connected to the desired outside party through the other PBX which has PBX code "952".

Note: The DISA/TIE user code (assigned in program [811]) is required when the CO line security mode is selected in program [439].

■ Call Forwarding / Call Transfer to CO line

<Example>



Feature Descriptions

Explanation

Extension 1011 dials as follows:

1. TIE line access code "7", PBX code "952" and extension number "1011".
2. The call is forwarded or transferred by extension 1011 of the other PBX which has PBX code "952" to the designated CO line.

3. TIE Line Routing Table

The TIE Line Routing Table is referenced by the system to identify the CO line route, when an extension user makes a TIE call. It is necessary to make unified routing tables with each PBX in your TIE line network.

A routing pattern appropriate for each call is decided by the first three digits (except the TIE line access code) of the dialed number. There are two system programs for the tables:

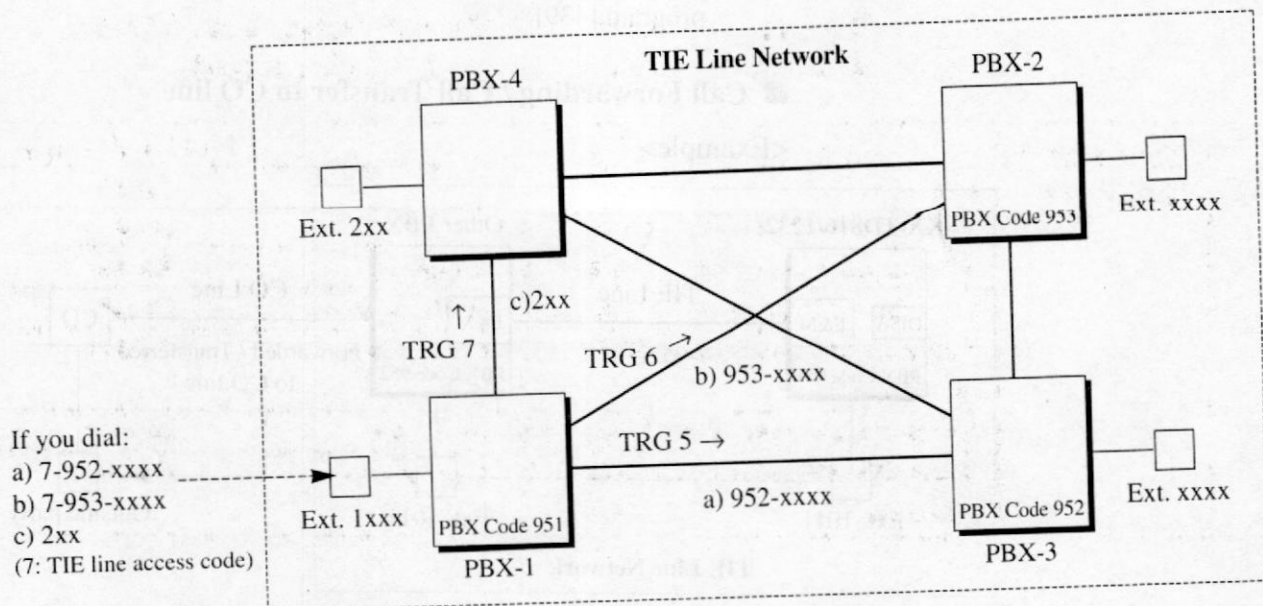
[340] TIE Line Routing Table: used to assign the access number (PBX code or extension number) and CO line group hunt sequence.

[341] TIE Modify Removed / Added Digit: used to assign removed and added digits of the dialed digits of the TIE call.

Programming Example

<Example>

Your system is PBX-1 and there are four PBXs in your TIE line network. To identify the CO line route as illustrated below, you should make the following routing table.



Feature Descriptions

TIE Line Routing Table of PBX-1

Location No.	PBX Code / Ext. No.	Removed Digit	Added Digit	CO Line Group Hunt Sequence				
				01	02	03	04	05
01	952	0		5	6			
02	953	0		6	5			
03	2xx	0		7				

Explanation

Location 01: The hunt sequence by dialing [7+PBX Code 952]:

The 1st route — CO line group (TRG) 5

The 2nd route — CO line group (TRG) 6

Location 02: The hunt sequence by dialing [7+PBX Code 953]:

The 1st route — CO line group (TRG) 6

The 2nd route — CO line group (TRG) 5

Location 03: The hunt sequence by dialing [Ext.no. 2xx]:

The 1st route — CO line group (TRG) 7

If the received number does not match the PBX Code, the system checks the number in the routing table. If it is found, the system automatically sends the number to the corresponding PBX.

For example, if PBX-1 receives the number “952-xxxx” from PBX-4, PBX-1 automatically sends the number through CO line group 5.

4. TIE Call Dialing Method

The following patterns are TIE call dialing methods. The dial number modification depends on the dialing method.

Your telephone	Dialing Method	Dial Modification
APT / DPT	Extension no.	Enable
	CO button + (PBX code) + Extension no.	Disable
	TIE line access code + (PBX code) + Extension no.	Enable
	CO button + PBX code (+ TIE user code) + Phone no.	Disable
	TIE line access code + PBX code (+ TIE user code) + Phone no.	Enable
	Select CO line group + (PBX code) + Extension no.	Disable
	Select CO line group + PBX code (+ TIE user code) + Phone no.	Disable

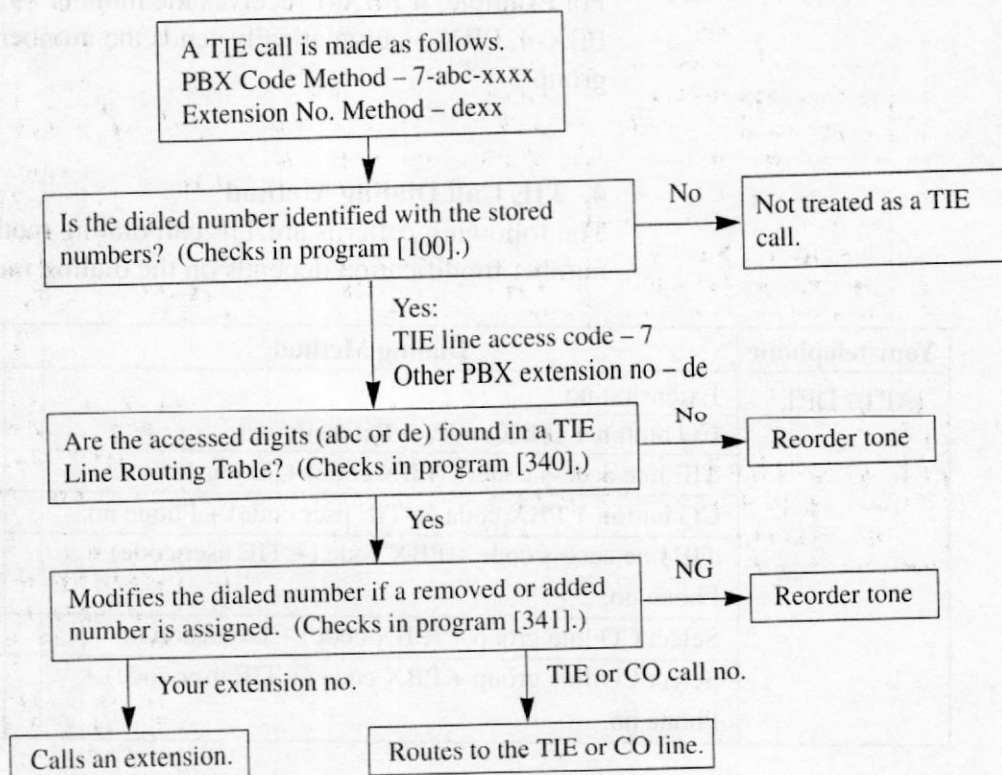
Feature Descriptions

Your telephone	Dialing Method	Dial Modification
SLT	Extension no.	Enable
	TIE line access code + (PBX code) + Extension no.	Enable
	TIE line access code + PBX code (+ Account code) + Phone no.	Enable
	Select CO line group + (PBX code) + Extension no.	Disable
	Select CO line group + PBX code (+ Account code) + Phone no.	Disable

In addition to the methods above, the system can use the TIE line for sending CO line access code "9" through other PBX. When you dial the CO line access code and the CO line is busy, the system automatically sends CO line access code "9" to a TIE line so that you can access the CO line through other PBX. This is enabled by program [990] "System Additional Information, Field (47)".

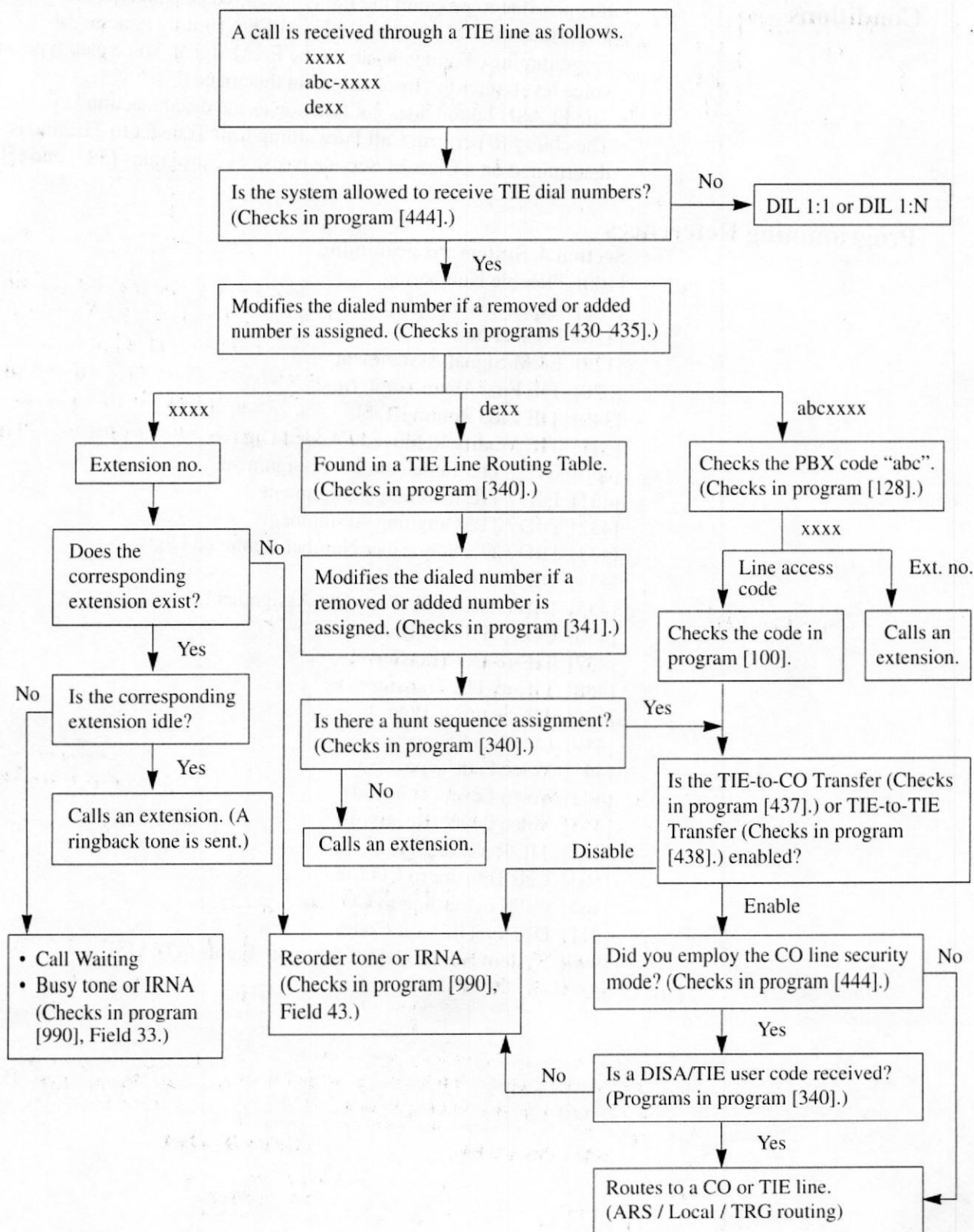
5. TIE Line Routing Flow Chart

Making a TIE Call from an Extension



Feature Descriptions

Receiving a Call through a TIE Line



Feature Descriptions

Conditions

- It is possible to program the E&M signal, voice path type and voice level (transmit / receive) of the E&M Line Unit by system programming. For details about the E&M signal, voice path type and voice level, refer to "Installation" in this manual.
- The FLASH button does not function as the disconnection key.
- The ability to perform Call Forwarding/Call Transfer to TIE line is determined on a Class of Service basis. See programs [503] and [504].

Programming References

Section 4, System Programming

- [100] Flexible Numbering
- [109] Expansion Unit Type
- [128] PBX Code
- [129] E&M Signal Assignment
- [220] TIE First / Inter Digit Time
- [340] TIE Line Routing Table
- [341] TIE Modify Removed / Added Digit
- [430] DID / TIE Table Number Assignment
- [431] DID / TIE Incoming Assignment
- [432] DID / TIE Outgoing Assignment
- [433] DID / TIE Subscriber Number Removed Digit
- [434] DID / TIE Added Number
- [435] DID / TIE Wink Time Out Assignment
- [436] CO-to-TIE Transfer
- [437] TIE-to-CO Transfer
- [438] TIE-to-TIE Transfer
- [439] TIE Security Type
- [440] Line Hunt Sequence
- [441] Voice Path Type
- [442] Voice Level (Transmit)
- [443] Voice Level (Receive)
- [444] TIE Receive Dial
- [503] Call Transfer to CO Line
- [504] Call Forwarding to CO Line
- [811] DISA / TIE User Codes
- [990] System Additional Information, Fields (47), (48)

Installation

Installation

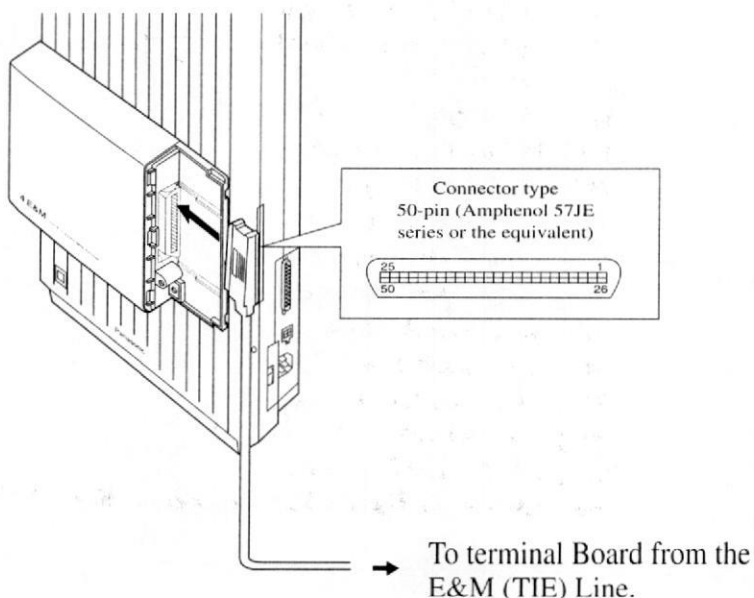
Installing one unit to the system allows four E&M (TIE) lines to be connected to CO lines 05 through 08 for the KX-TD816, or CO lines 09 through 12 or 21 through 24 for the KX-TD1232. This unit can be installed to any of the expansion areas provided on the front of the system.

For unit installation, refer to the procedure "Section 2.4.4 Installing Expansion Unit (KX-TD170/KX-TD180)" in the main Installation Manual. Steps 1 through 5 and 7 through 10 of the installation procedure are the same as other expansion units. Step 6 is different for each unit. Please note the following instructions below instead of step 6 (Installation Manual) for this unit.

- Note**
- System Programming [109] Expansion Unit Type is required for expansion unit location identification.

Step 6

- If the KX-TD184 is installed, use an Amphenol Connector to connect the E&M (TIE) lines. Insert the connector into the jack.



- Be sure to secure the inside screw, or the unit may not work properly.
- To fix the connector, refer to "Section 2.4.4 Installing Expansion Unit (KX-TD170/KX-TD180), Amphenol 57 Type (screw-attach-type 50-pin connector) Connection for KX-TD170" in the main Installation Manual.
- For jack connection, please see "Cable Pin Numbers to Be Connected" on the next page.
- The KX-TD1232 is illustrated above.

Installation

■ Cable Pin Numbers to be Connected (E&M Line)

Connect Pin	Cable Color	Clip No.	Number of Dots	E&M Line	
1-6	ORN-RED	1	1	NO.1	T } 2-wire or 4-wire - send
26-3	ORN-BLK	2	1		R } 2-wire or 4-wire - send
2-5	YEL-RED	3	1		T1 } 4-wire - receive
27-4	YEL-BLK	4	1		R1 } 4-wire - receive
3-7	GRY-RED	5	1		E Lead
28-8	GRY-BLK	6	1		SG Lead
4	WHY-RED	7	1		SB Lead
29	WHY-BLK	8	1		M1 Lead
5	ORN-RED	9	1		SG0
30-2	ORN-BLK	10	1		M Lead only for Type 5
6	YEL-RED	11	2	NO.2	T } 2-wire or 4-wire - send
31	YEL-BLK	12	2		R } 2-wire or 4-wire - send
7	GRY-RED	13	2		T1 } 4-wire - receive
32	GRY-BLK	14	2		R1 } 4-wire - receive
8	WHY-RED	15	2		E Lead
33	WHY-BLK	16	2		SG Lead
9	ORN-RED	17	2		SB Lead
34	ORN-BLK	18	2		M1 Lead
10	YEL-RED	19	2		SG0
35	YEL-BLK	20	2		M Lead only for Type 5
11	GRY-RED	21	3	NO.3	T } 2-wire or 4-wire - send
36	GRY-BLK	22	3		R } 2-wire or 4-wire - send
12	WHY-RED	23	3		T1 } 4-wire - receive
37	WHY-BLK	24	3		R1 } 4-wire - receive
13	ORN-RED	25	3		E Lead
38	ORN-BLK	26	3		SG Lead
14	YEL-RED	27	3		SB Lead
39	YEL-BLK	28	3		M1 Lead
15	GRY-RED	29	3		SG0
40	GRY-BLK	30	3		M Lead only for Type 5
16	WHY-RED	31	4	NO.4	T } 2-wire or 4-wire - send
41	WHY-BLK	32	4		R } 2-wire or 4-wire - send
17	ORN-RED	33	4		T1 } 4-wire - receive
42	ORN-BLK	34	4		R1 } 4-wire - receive
18	YEL-RED	35	4		E Lead
43	YEL-BLK	36	4		SG Lead
19	GRY-RED	37	4		SB Lead
44	GRY-BLK	38	4		M1 Lead
20	WHY-RED	39	4		SG0
45	WHY-BLK	40	4		M Lead only for Type 5

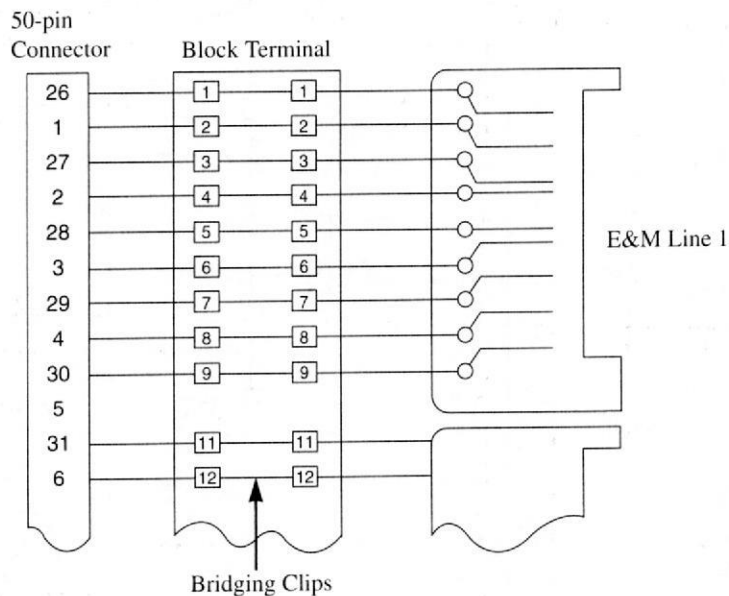
Note:

21-25, 46-50: Cannot be connected

Installation

■ Cable Pin Numbers to be Connected (E&M Line)

• E&M Line Wiring

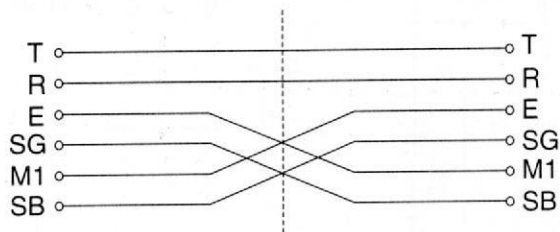


■ Connecting to another KX-TD816/KX-TD1232 system (KX-TD184)

(1) 2-wire voice path

KX-TD184

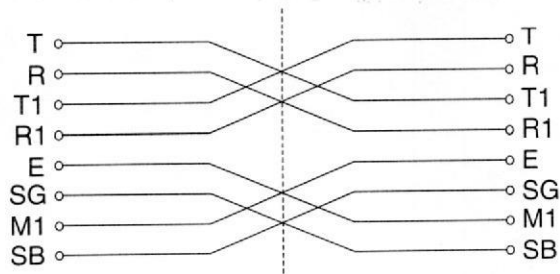
Another KX-TD184



(2) 4-wire voice path

KX-TD184

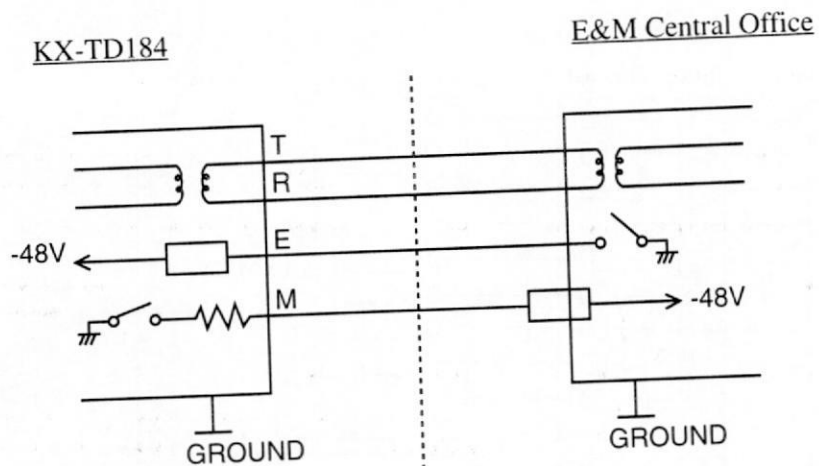
Another KX-TD184



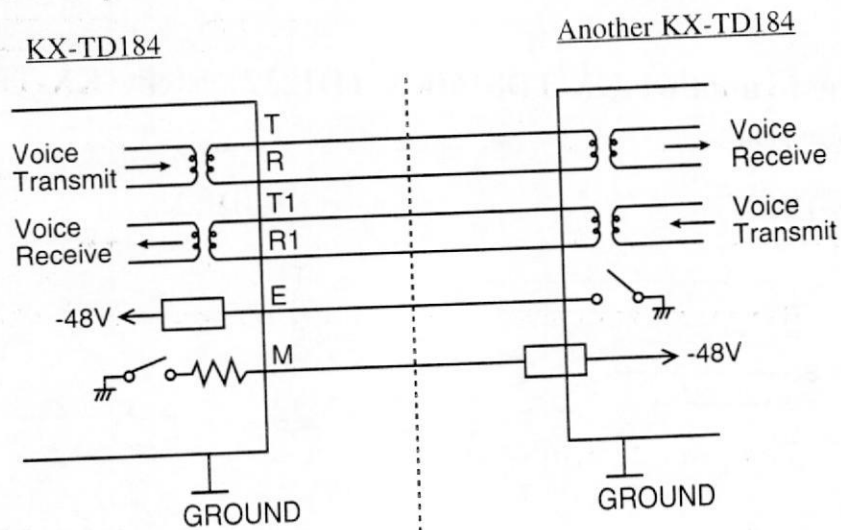
Installation

■ Connecting to the E&M Central Office

(1) 2-wire voice path



(2) 4-wire voice path

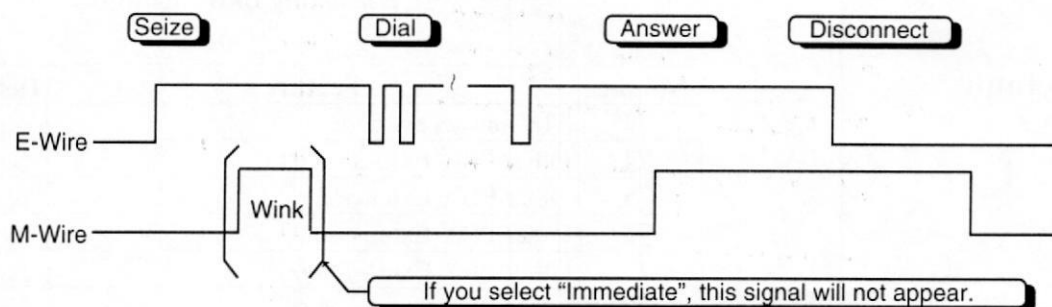


Installation

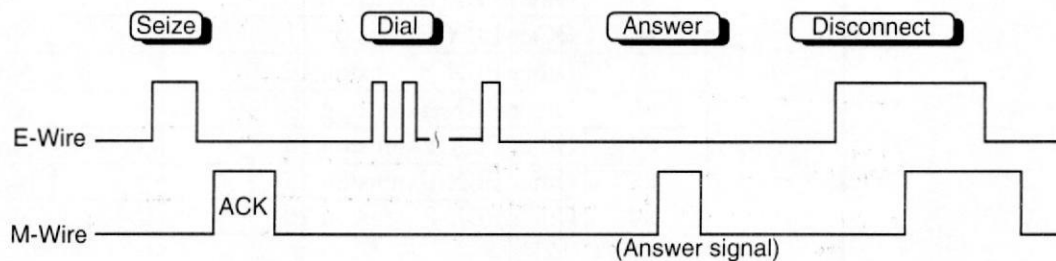
■ E&M Sequences

You can choose one of the following E&M sequences by System Programming [129] "E&M Signal Assignment".

(1) Continuous E&M

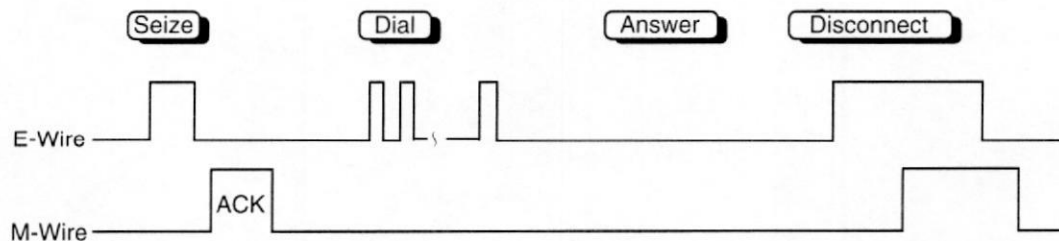


(2) Pulsed E&M with Answer signal



※If you select this sequence, then you must select "Wink" as the start type.

(3) Pulsed E&M without Answer signal



※If you select this sequence, then you must select "Wink" as the start type.

*Flexible Numbering***Description**

Assigns the TIE line access code and the leading one or two digits of the other PBX extension numbers.

Selection

- Selection number: **73 through 89**
- Feature number: **1 to 3 digits** (for selection number 73),
1 or 2 digits (for selection numbers 74 through 89), consisting of **0 through 9**

Default

Number	Feature	Default
73	TIE line access code	None
74	Other PBX Extension 01	None
75	Other PBX Extension 02	None
76	Other PBX Extension 03	None
77	Other PBX Extension 04	None
78	Other PBX Extension 05	None
79	Other PBX Extension 06	None
80	Other PBX Extension 07	None
81	Other PBX Extension 08	None
82	Other PBX Extension 09	None
83	Other PBX Extension 10	None
84	Other PBX Extension 11	None
85	Other PBX Extension 12	None
86	Other PBX Extension 13	None
87	Other PBX Extension 14	None
88	Other PBX Extension 15	None
89	Other PBX Extension 16	None

For the programming sequence and more information, refer to the program [100] "Flexible Numbering" in the main Installation Manual.

Expansion Unit Type

Description	Assigns the type of expansion units to be used in the system. This allows the system to identify the unit in each expansion unit location. <i>Select "EM" to use an 4-E&M Line Unit.</i>
Selection	KX-TD816 • Areas 1; 2 = C / BD / MD / EM / E / A (C: 4-CO Line Unit / BD: 4-DID Line Unit with Pulse/DTMF / MD: 4-DID Line Unit with MFC / EM: 4-E&M Line Unit / E: 8-Station Line Unit / A: 16-SLT Line Unit) KX-TD1232 • Master / Slave • Areas 1; 2; 3 = C / BD / MD / EM / E1 / E2 / A1 / A2 (C: 4-CO Line Unit / BD: 4-DID Line Unit with Pulse/DTMF / MD: 4-DID Line Unit with MFC / EM: 4-E&M Line Unit / E1: 8-Station Line Unit 1 / E2: 8-Station Line Unit 2 / A1: 16-SLT Line Unit 1 / A2: 16-SLT Line Unit 2)
Default	KX-TD816: C;E KX-TD1232: Master and Slave – C;E1;E2
Programming	KX-TD816 1. Enter 109. Display: 109 EXPAND C, E1 2. Press NEXT. Display example: Master:C ;E 3. Keep pressing SELECT until the desired selection of Area 1 is displayed. 4. Press ➡ to program Area 2, if required. 5. Keep pressing SELECT until the desired selection of Area 2 is displayed. 6. Press STORE. 7. Press END.

Expansion Unit Type (contd.)

KX-TD1232

1. Enter **109**.
Display: 109 EXPAND C, E1
2. Press **NEXT** to program the Master System.
To program the "Slave", press **NEXT** again.
Display example: Master:C ;E1;E2
3. Keep pressing **SELECT** until the desired selection of Area 1 is displayed.
4. Press ➡ to program another Area, if required.
5. Keep pressing **SELECT** until the desired selection of the Area is displayed.
6. Repeat steps 4 and 5 until all of the required entries are completed, if required.
7. Press **STORE**.
If only one system is in operation, go to step 10.
8. Press **NEXT** to program the Slave System.
Display example: Slave :C ;E1;E2
9. Repeat steps 3 through 7, if required.
10. Press **END**.

Conditions

- There are two expansion areas in the KX-TD816, areas 1 and 2 from bottom to top. Either one 8-Station Line Unit or 16-SLT Line Unit and either one 4-CO Line Unit, 4-E&M Line Unit, 4-DID Line Unit with Pulse/DTMF or 4-DID Line Unit with MFC can be installed.
- There are three expansion areas in each system for the KX-TD1232, areas 1, 2 and 3 from bottom to top. Either up to two 8-Station Line Units or 16-SLT Line Units and either one 4-CO Line Unit, 4-E&M Line Unit, 4-DID Line Unit with Pulse/DTMF or 4-DID Line Unit with MFC can be installed in each system.
- An out-of-service system is unassignable. In this case, skip steps 8 and 9 for the KX-TD1232.
- For the KX-TD1232, if only the Slave System is in operation, the display shows "Slave" in step 2.
- After changing the setting, turn the Power Switch off and on once. Otherwise, the previous setting will remain.

PBX Code

Description	Assigns the PBX Code as your location number if the "PBX Code method" is employed for Tie Line Network calling.
Selection	PBX Code: 1 to 3 digits
Default	Not Stored
Programming	1. Enter 128. Display: 128 PBX CODE 2. Press NEXT. Display: Code: 3. Enter a PBX Code. To change the current entry, press CLEAR and enter the new code. 4. Press STORE. 5. Press END.
Conditions	• Valid numbers for the PBX Code are 0 through 9. • The PBX Code method is: PBX Code + Extension number.

E&M Signal Assignment

Description

Assigns the E&M signal. There are three signals available:

Continuous: Continuous E&M (Wink/Immediate)

Pulsed Ans: Pulsed E&M with Answer Signal (Wink only)

Pulsed No Ans: Pulsed E&M without Answer Signal (Wink only)

Selection

Continuous / Pulsed Ans / Pulsed No Ans

Default

Continuous

Programming

1. Enter **129**.

Display: 129 E&M SIGNAL

2. Press **NEXT**.

Display example: E&M Continuous

3. Keep pressing **SELECT** until the desired selection is displayed.

4. Press **STORE**.

5. Press **END**.

Conditions

- If you select "Pulsed Ans" or "Pulsed No Ans", you must select "Wink" as the start type.

TIE First / Inter Digit Time

Description

Assigns the maximum time allowed between the start of the dial tone and the first digit dialed (First Digit Time), and between digits (Inter Digit Time) on an TIE call. If an extension user fails to dial any digits during this time, the DTMF receiver is released. This timer applies until the Toll Restriction check is completed.

Selection

Time (seconds): **3 to 30**

Default

5 s *10*

Programming

1. Enter **220**.

Display: 220 TIE TIMER

2. Press **NEXT**.

Display example: Time:5 sec

3. Enter the **time**.

To change the current entry, press **CLEAR** and enter the new time.

4. Press **STORE**.

5. Press **END**.

Conditions

- This timer is used for toll restriction checking.
- You cannot leave the entry empty.

Feature References

Section 3, Features
Toll Restriction

TIE Line Routing Table**Description**

The TIE line routing table can be programmed. This table is referenced by the system to identify the CO line route, when an extension user makes a TIE call.

A routing pattern appropriate for each call is decided by the first three digits (except the TIE line access code) of the dialed number. This program assigns the TIE line access code and CO line group hunt sequence.

Selection

- Location number: **01 through 32**
- TIE line access code: **1 to 3 digits**
- CO line group hunt sequence number: **1 through 8 (5 entry max.)**

Default

All locations – Not stored

Programming

1. Enter **340**.

Display example: 340 TIE ROUTE

2. Press **NEXT**.

Display: Location NO?→

3. Enter a **location number**.

To enter location number 01, you can also press **NEXT**.

Display example: 01:

4. Enter a **TIE line access code**.

To delete the current entry, press **CLEAR**.

To change the current entry, press **CLEAR** and enter the new number.

5. Press **➡** to program the CO line group hunt sequence number.

6. Enter a **CO line group hunt sequence number**.

To delete the current entry, press **CLEAR**.

To change the current entry, press **CLEAR** and enter the new number.

7. Press **STORE**.

8. To program another location, press **NEXT** or **PREV**, or **SELECT** and the desired **location number**.

9. Repeat steps 4 through 8.

10. Press **END**.

Conditions

- Each TIE line access code has a maximum of three digits, consisting of **0 through 9** and *****. The character “*****” can be used as a wild card character.
- Program [341] “TIE Removed / Added Digit” is used to modify the TIE line access code.

TIE Modify Removed / Added Digit

Description

Assigns the removed and added digits of the TIE call received digits. Digits are removed and added from the beginning of the dialed digits.

Selection

- Location number: **01 through 32**
- Number of digits to be deleted: **0 to 4** (0=no deletion)
- Number to be added: **4 digits (max.)**

Default

All locations – Deleted digit: 0, Added digit: Blank

Programming

1. Enter **341**.

Display: 341 TIE MODIFY

2. Press **NEXT**.

Display: Location NO?→

3. Enter a **location number**.

To enter location number 01, you can also press **NEXT**.

Display example: 01:0,

4. Enter the **number of digits to be deleted**.

To change the current entry, press **CLEAR** and enter the new number.

5. Press ➡ to program the number to be added.

6. Enter the **number to be added**.

To change the current entry, press **CLEAR** and enter the new number.

7. Press **STORE**.

8. To program another location, press **NEXT** or **PREV**, or **SELECT** and the desired **location number**.

9. Repeat steps 4 through 8.

10. Press **END**.

Conditions

Each added number has a maximum of 4 digits, consisting of **0 through 9**.

DID / TIE Table Number Assignment

Description	Assigns a DID / TIE table number to each CO line group.
Selection	• CO line group (TRG) number: 1 through 8, * (* =all CO line groups) • DID / TIE table number: 1 to 4
Default	All CO line groups – Not stored
Programming	1. Enter 430. Display: 430 MODIFY TABLE 2. Press NEXT. Display: TRK GRP NO?→ 3. Enter a CO line group number. To enter CO line group number 1, you can also press NEXT. Display example: TRG1:Not Stored 4. Enter a DID / TIE table number. To change the current entry, press CLEAR and the new number. 5. Press STORE. 6. To program another CO line group, press NEXT or PREV, or SELECT and the desired CO line group number. 7. Repeat steps 4 through 6. 8. Press END.
Conditions	This is the first and basic programming for the DID and TIE features. If this assignment is changed, it affects other programming ([431] through [435]).

DID / TIE Incoming Assignment

Description

Assigns a DID and TIE incoming method, immediate or wink, to each DID / TIE table according to your central office service.

Immediate: Incoming DID and TIE calls can be received right after the receiving signal arrives.

Wink: Incoming DID and TIE calls can be received after the wink signal is transmitted to the central office (after the receiving signal arrives).

Selection

- DID / TIE table number: **1 to 4, *** (* =all DID / TIE tables)
- **Immediate / Wink**

Default

All DID / TIE tables – Wink

Programming

1. Enter **431**.
Display: 431 SIGNAL IN
2. Press **NEXT**.
Display: Table NO?→
3. Enter a **DID / TIE table number**.
To enter DID / TIE table number 1, you can also press **NEXT**.
Display example: 1:Wink
4. Keep pressing **SELECT** until the desired selection is displayed.
5. Press **STORE**.
6. To program another DID / TIE table, press **NEXT** or **PREV**, or **SELECT** and the desired **DID / TIE table number**.
7. Repeat steps 4 through 6.
8. Press **END**.

Conditions

To assign all DID / TIE tables to one selection, press the ***** key in step 3. In this case, the display shows the contents programmed for DID / TIE table number 1.

DID / TIE Outgoing Assignment**Description**

Assigns a DID and TIE outgoing method, immediate or wink, to each DID / TIE table according to your central office service.

Immediate: Outgoing DID and TIE numbers can be transmitted right after seizing the CO line.

Wink: Outgoing DID and TIE numbers can be transmitted after receiving the wink signal from the central office after seizing the CO line.

Selection

- DID / TIE table number: **1 to 4**, * (* =all DID / TIE tables)
- **Immediate / Wink**

Default

All DID / TIE tables – Wink

Programming

1. Enter **432**.

Display: 432 SIGNAL OUT

2. Press **NEXT**.

Display: Table NO?→

3. Enter a **DID / TIE table number**.

To enter DID / TIE table number 1, you can also press **NEXT**.

Display example: 1:Wink

4. Keep pressing **SELECT** until the desired selection is displayed.

5. Press **STORE**.

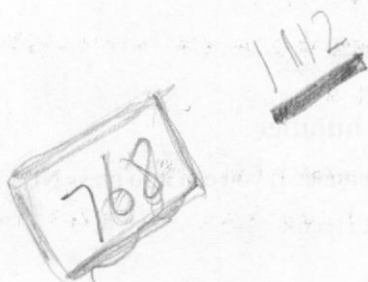
6. To program another DID / TIE table, press **NEXT** or **PREV**, or **SELECT** and the desired **DID / TIE table number**.

7. Repeat steps 4 through 6.

8. Press **END**.

Conditions

- The time the system waits for the confirmation wink signal can be programmed in program [435] "DID / TIE Wink Time Out Assignment". The system disconnects the CO line when the time-out time expires.
- To assign all DID / TIE tables to one selection, press the * key in step 3. In this case, the display shows the contents programmed for DID / TIE table number 1.



DID / TIE Subscriber Number Removed Digit

Description

Assigns the removed digits of the received DID and TIE subscriber numbers to each DID / TIE table. Digits are removed from the beginning of the received digits.

Selection

- DID / TIE table number: **1 to 4**
- Number of digits to be deleted (RMV): **0 through 6**
(0=no deletion)

Default

All DID / TIE tables – RMV:0

Programming

1. Enter **433**.
Display: 433 REMOVE DIAL
2. Press **NEXT**.
Display: Table NO?→
3. Enter a **DID / TIE table number**.
To enter DID / TIE table number 1, you can also press **NEXT**.
Display example: 1:1
4. Enter the **number of digits to be deleted**.
To change the current entry, press **CLEAR** and the new number.
5. Press **STORE**.
6. To program another DID / TIE table, press **NEXT** or **PREV**, or **SELECT** and the desired **DID / TIE table number**.
7. Repeat steps 4 through 6.
8. Press **END**.

Conditions

You cannot leave the entry empty.

DID / TIE Added Number

Description

Assigns the added number to the DID and TIE subscriber number which is determined in program [433] "DID / TIE Subscriber Number Removed Digit". This makes the final number which serves as the extension number. Note that digits are inserted at the beginning of the number.

Selection

- DID / TIE table number: **1 to 4**
- Number to be added: **4 digits (max.)**

Default

All DID / TIE tables – Not Stored

Programming

1. Enter **434**.

Display: 434 ADD DIAL

2. Press **NEXT**.

Display: Table NO?→

3. Enter a **DID / TIE table number**.

To enter DID table number 1, you can also press **NEXT**.

Display example: 1:2

4. Enter the **number to be added**.

To change the current entry, press **CLEAR** and enter the new number.

5. Press **STORE**.

6. To program another DID / TIE table, press **NEXT** or **PREV**, or **SELECT** and the desired **DID / TIE table number**.

7. Repeat steps 4 through 6.

8. Press **END**.

Conditions

Each added number has a maximum of 4 digits, consisting of **0 through 9**.

DID / TIE Wink Time Out Assignment

Description

The DID and TIE outgoing method can be set to the wink mode in program [432] "DID / TIE Outgoing Assignment". This program sets the time the system waits for the confirmation wink signal after a CO line is seized according to your central office service. The system disconnects the CO line when the time-out expires.

Selection

- DID / TIE table number: **1 to 4, *** (* =all DID / TIE tables)
- Time: **1 through 127** (× 64 milliseconds is the actual time)

Default

All DID / TIE tables – 16

Programming

1. Enter **435**.
Display: 435 WINK TIMEOUT
2. Press **NEXT**.
Display: Table NO?→
3. Enter a **DID / TIE table number**.
To enter DID / TIE table number 1, you can also press **NEXT**.
Display example: 1:16
4. Enter the **time**.
To change the current entry, press **CLEAR** and enter the new number.
5. Press **STORE**.
6. To program another DID / TIE table, press **NEXT** or **PREV**, or **SELECT** and the desired **DID / TIE table number**.
7. Repeat steps 4 through 6.
8. Press **END**.

Conditions

- You cannot leave the entry empty.
- To assign all DID / TIE tables to one selection, press the ***** key in step 3. In this case, the display shows the contents programmed for DID / TIE table number 1.

CO-to-TIE Transfer

Description

Enables or disables transferring an incoming outside call to the TIE line on a CO line group basis. This restriction applies to the following: 1) A TIE call using DISA 2) Call Forwarding to a TIE line 3) Call Transfer to a TIE line.

Selection

- CO line group (TRG) number: **1 through 8, ***
(* =all CO line groups)
- **Enable / Disable**

Default

All CO line groups – Disable

Programming

1. Enter **436**.
Display : 436 CO-TIE XFER
2. Press **NEXT**.
Display: TRK GRP NO?→
3. Enter a **CO line group number**.
To enter CO line group number 1, you can also press **NEXT**.
Display example: TRG1:Disable
4. Keep pressing **SELECT** until the desired selection is displayed.
5. Press **STORE**.
6. To program another CO line group, press **NEXT** or **PREV**, or **SELECT** and the desired **CO line group number**.
7. Repeat steps 4 through 6.
8. Press **END**.

Conditions

None

TIE-to-CO Transfer

Description

Enables or disables transferring TIE calls to a CO line on a CO line group basis. This restriction applies to the following: 1) An outside call through another PBX 2) Call Forwarding to a CO line 3) Call Transfer to a CO line.

Selection

- CO line group (TRG) number: **1 through 8, ***
(* =all CO line groups)
- **Enable / Disable**

Default

All CO line groups – Disable

Programming

1. Enter **437**.
Display : 437 TIE-CO XFER
2. Press **NEXT**.
Display: TRK GRP NO?→
3. Enter a **CO line group number**.
To enter CO line group number 1, you can also press **NEXT**.
Display example: TRG1:Disable
4. Keep pressing **SELECT** until the desired selection is displayed.
5. Press **STORE**.
6. To program another CO line group, press **NEXT** or **PREV**, or **SELECT** and the desired **CO line group number**.
7. Repeat steps 4 through 6.
8. Press **END**.

Conditions

None

TIE-to-TIE Transfer

Description

Enables or disables transferring TIE calls to a TIE line on a CO line group basis. This restriction applies to the following: 1) A TIE call through another PBX 2) Call Forwarding to a TIE line 3) Call Transfer to a TIE line.

Selection

- CO line group (TRG) number: **1 through 8, ***
(* =all CO line groups)
- **Enable / Disable**

Default

All CO line groups – Enable

Programming

1. Enter **438**.

Display : 438 TIE-TIE XFER

2. Press **NEXT**.

Display: TRK GRP NO?→

3. Enter a **CO line group number**.

To enter CO line group number 1, you can also press **NEXT**.

Display example: TRG1:Enable

4. Keep pressing **SELECT** until the desired selection is displayed.

5. Press **STORE**.

6. To program another CO line group, press **NEXT** or **PREV**, or **SELECT** and the desired **CO line group number**.

7. Repeat steps 4 through 6.

8. Press **END**.

Conditions

None

TIE Security Type

Description

Assigns the security mode for TIE calls. There are two modes, Non Security and Trunk Security (CO line security). Non Security mode allows the caller to access a CO line without dialing a TIE user code. Trunk Security mode requires the caller to enter a TIE User Code assigned in program [811] "DISA / TIE User Codes" before making a TIE call.

Selection

- CO line group (TRG) number: **1 through 8, ***
(* =all CO line groups)
- **Non** (non security) / **Trunk** (trunk security)

Default

Non

Programming

1. Enter **439**.
Display: 439 TIE SECURITY
2. Press **NEXT**.
Display: TRK GRP NO?→
3. Enter a **CO line group number**.
To enter CO line group number 1, you can also press **NEXT**.
Display example: TRG1:Non
4. Keep pressing **SELECT** until the desired selection is displayed.
5. Press **STORE**.
6. Press **END**.

Conditions

None

Line Hunting Sequence

Description

Assigns the hunting sequence of idle lines, seizing from the smallest to the largest line number or vice versa in a CO line group, on a CO line group basis.

Selection

- CO line group (TRG) number: **1 through 8, ***
(* =all CO line groups)
- **Small → Large / Large → Small**

Default

All CO line groups – Small → Large

Programming

1. Enter **440**.

Display : 440 LINE HUNT

2. Press **NEXT**.

Display: TRK GRP NO?→

3. Enter a **CO line group number**.

To enter CO line group number 1, you can also press **NEXT**.

Display example: TRG1:Large→Small

4. Keep pressing **SELECT** until the desired selection is displayed.

5. Press **STORE**.

6. To program another CO line group, press **NEXT** or **PREV**, or **SELECT** and the desired **CO line group number**.

7. Repeat steps 4 through 6.

8. Press **END**.

Conditions

The default setting (Small → Large) often may cause a busy situation between two PBXs, as the same line may be seized by both sides simultaneously. In this case, we recommend changing the setting of either PBX to Large → Small.

Voice Path Type

Description	Assigns the voice path type on a CO line basis.
Selection	• CO line number: KX-TD816 – 05 through 08, * (*=all CO lines) KX-TD1232 – 09 through 12 (Master), 21 through 24 (Slave), * (*=all CO lines) • 2 wire / 4 wire
Default	All CO lines – 2 wire
Programming	1. Enter 441. Display: 441 V.PATH TYPE 2. Press NEXT. Display: CO Line NO?→ 3. Enter a CO line number. To enter CO line number 09, you can also press NEXT. Display example: CO09:2 Wire 4. Keep pressing SELECT until the desired selection is displayed. 5. Press STORE. 6. Press END.
Condition	To assign all CO lines to one selection, press the * key in step 3.

Voice Level (Transmit)

Description	Assigns the transmitted voice level on a CO line port basis. This program is valid only when the voice path type is set to "4 wire".
Selection	• CO line number: KX-TD816 – 05 through 08, * (* =all CO lines) KX-TD1232 – 09 through 12 (Master), 21 through 24 (Slave), * (* =all CO lines) • -6 db / -3 db / 0 db / +3 db
Default	All CO lines – -3db
Programming	1. Enter 442. Display: 442 V.LEVEL (TX) 2. Press NEXT. Display: CO Line NO?→ 3. Enter a CO line number. To enter CO line number 09, you can also press NEXT. Display example: C009:-3db 4. Keep pressing SELECT until the desired selection is displayed. 5. Press STORE. 6. Press END.
Conditions	To assign all CO lines to one selection, press the * key in step 3.

Voice Level (Receive)

Description

Assigns the received voice level on a CO line basis. This program is valid only when the voice path type is set to "4 wire".

Selection

- CO line number:
KX-TD816 – **05 through 08**, * (*=all CO lines)
KX-TD1232 – **09 through 12** (Master), **21 through 24** (Slave),
* (*=all CO lines)
- **-6 db / -3 db / 0 db / +3 db**

Default

All CO lines – -3db

Programming

1. Enter **443**.
Display: 443 V.LEVEL (RX)
2. Press **NEXT**.
Display: CO Line NO?→
3. Enter a **CO line number**.
To enter CO line number 09, you can also press **NEXT**.
Display example: C009:-3db
4. Keep pressing **SELECT** until the desired selection is displayed.
5. Press **STORE**.
6. Press **END**.

Conditions

To assign all CO lines to one selection, press the * key in step 3.

TIE Receive Dial**Description**

Assigns whether the system receives TIE dial numbers on a CO line basis. If "No" is selected, the dialed number is treated as a local number and sent to DIL 1 : 1 or DIL 1 : N.

Selection

- CO line number:
KX-TD816 – **05 through 08**, * (* =all CO lines)
KX-TD1232 – **09 through 12** (Master), **21 through 24** (Slave),
* (* =all CO lines)
- Yes / No

Default

All CO line ports – Yes

Programming

1. Enter **444**.

Display: 444 RECEIVE DIAL

2. Press **NEXT**.

Display: CO Line NO?→

3. Enter a **CO line number**.

To enter CO line number 09, you can also press **NEXT**.

Display example: CO09:Yes

4. Keep pressing **SELECT** until the desired selection is displayed.
5. Press **STORE**.
6. Press **END**.

Conditions

To assign all CO lines to one selection, press the * key in step 3.

DISA / TIE User Codes

Description

Assigns the DISA and TIE User Codes and a Class of Service (COS) to each code. The code COS determines the toll restriction level of the DISA and TIE caller.

Selection

- DISA / TIE user code number: **01 through 32**
- DISA / TIE user code: **4 to 10 digits**
- COS number: **1 through 8**

Default

Code 01=0001 – COS 8
Code 02=0002 – COS 8
Code 03=0003 – COS 8
:
Code 32=0032 – COS 8

Programming

1. Enter **811**.
Display: 811 USER CODE
2. Press **NEXT**.
Display: User Code NO?→
3. Enter a **DISA / TIE user code number**.
To enter user code number 01, you can also press **NEXT**.
Display example: 01:0001 C:8
4. Enter a **DISA / TIE user code**.
To change the current entry, enter the new code.
5. Press ➡ to program the **COS**.
6. Enter a **COS number**.
To change the current entry, enter the new COS number.
7. Press **STORE**.
8. To program another user code, press **NEXT** or **PREV**, or **SELECT** and the desired **DISA / TIE user code number**.
9. Repeat steps 4 through 8.
10. Press **END**.

Conditions

- This setting is required if the Trunk (CO line) Security mode is selected in programs [439] "TIE Security Type" and [809] "DISA Security Type".
- Each user code should be unique and composed of eight numerical digits, **0 through 9**.
- You cannot leave an entry empty.

System Additional Information

Description

Field (47) in Area 6 give additional information about the TIE line service.

Area 06

Display
example

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

↓
(47)

Field number

Explanation for Field (47)

Area	Field	Description	Selection	Default
06	(47)	Enables or disables sending CO line access code "9" to a TIE line. When you dial CO line access code "9" and the CO line is busy, the system can automatically send CO line access code "9" to a TIE line so that you can access the CO line through another PBX.	0 : enable 1 : disable	1

For the programming sequence and more information, refer to the program [100] "Flexible Numbering" in the main Installation Manual.

Programming Tables

[100] Flexible Numbering			
Item	Feature	Default	Parameter
73	TIE line access code	None	
74	Other PBX Extension 01	None	
75	Other PBX Extension 02	None	
76	Other PBX Extension 03	None	
77	Other PBX Extension 04	None	
78	Other PBX Extension 05	None	
79	Other PBX Extension 06	None	
80	Other PBX Extension 07	None	
81	Other PBX Extension 08	None	
82	Other PBX Extension 09	None	
83	Other PBX Extension 10	None	
84	Other PBX Extension 11	None	
85	Other PBX Extension 12	None	
86	Other PBX Extension 13	None	
87	Other PBX Extension 14	None	
88	Other PBX Extension 15	None	
89	Other PBX Extension 16	None	
(Selection) No.73: 1 – 3 digits, No.74 – 89: 1 or 2 digits, (Valid Entries) 0 – 9			

[128] PBX Code	
Default	Parameter : 1 – 3 digits, 0 – 9
Not stored	

[129] E&M Signal Assignment		
	Default	Selection
Continuous	✓	
Pulsed Ans		
Pulsed No Ans		

[220] TIE First / Inter Digit Time	
Default	5 s
Parameter	10
Selection	3 – 30

[109] Extension Card / Unit Type																									
TD816	Area No.	1					2																		
	Selection	C	BD	MD	EM	E	A	C	BD	MD	EM	E	A												
	Default	✓			✓							✓													
	Parameter																								
TD1232	Master System																								
	Area No.	1						2						3											
	Selection	C	BD	MD	EM	E1	E2	A1	A2	C	BD	MD	EM	E1	E2	A1	A2	C	BD	MD	EM	E1	E2	A1	A2
	Default	✓											✓									✓			
	Parameter																								
	Slave System																								
	Area No.	1						2						3											
	Selection	C	BD	MD	EM	E1	E2	A1	A2	C	BD	MD	EM	E1	E2	A1	A2	C	BD	MD	EM	E1	E2	A1	A2
	Default	✓											✓									✓			
	Parameter																								

<Note>
 TD816 – C:4CO, BD:4Both Way DID, MD:4DID with MFC, EM:4E&M, E:8EXT, A:16SLT
 TD1232 – C:4CO, BD:4Both Way DID, MD:4DID with MFC, EM:4E&M, E1:8EXT-1, E2:8EXT-2, A1:16SLT-1, A2:16SLT-2

Programming Tables

Item : Location No.	[340] TIE Line Routing Table		[341] TIE Modify Removed / Added Digit	
	Parameter : TIE line access code (3 digits max.), consisting of 0 - 9, *.	Parameter : CO line group hunt sequence no. (1 - 8), 5 entries max., consisting of 0 - 9, *.	Parameter : No. of digits to be deleted (0 - 4)	Parameter : No. to be added (4 digits max.), consisting of 0 - 9.
Default: all	Not Stored	Not Stored	0	Not Stored
all locations				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				

Programming Tables

	[430] DID / TIE Table Number Assignment	[436] CO-to-TIE Transfer		[437] TIE-to-CO Transfer		[438] TIE-to-TIE Transfer	
Item : CO Line Group No.	Parameter: DID / TIE Table No. (1 - 4)	Selection		Selection		Selection	
		Enable	Disable	Enable	Disable	Enable	Disable
Default : all	Not Stored		✓		✓	✓	
all CO line groups							
1							
2							
3							
4							
5							
6							
7							
8							

	[439] TIE Security Type		[440] Line Hunting Sequence	
Item : CO Line Group No.	Selection		Selection	
	Non	Trunk	Small→Large	Large→Small
Default : all	✓		✓	
all CO line groups				
1				
2				
3				
4				
5				
6				
7				
8				

	[431] DID / TIE Incoming Assignment		[432] DID / TIE Outgoing Assignment	
Item : DID / TIE Table No.	Selection		Selection	
	Immediate	Wink	Immediate	Wink
Default : all		✓		✓
all tables				
1				
2				
3				
4				

Programming Tables

	[433] DID / TIE Subscriber Number Removed Digit	[434] DID / TIE Added Number	[435] DID / TIE Wink Time Out Assignment
Item : DID / TIE Table No.	Parameter : No. of digits to be deleted (0 - 6)	Parameter : No. to be added (4 digits max.), consisting of 0 - 9.	Selection: 1 - 127 (× 64 msec)
Default: all	0	Not Stored	16
all tables			
1			
2			
3			
4			

		[441] Voice Path Type		[442] Voice Level (Transmit)				[443] Voice Level (Receive)				[444] TIE Receive Dial	
	Item : CO Line No.	Selection		Selection				Selection				Selection	
		2 wire	4 wire	-6 db	-3 db	0 db	+3 db	-6 db	-3 db	0 db	+3 db	Yes	No
	Default : all	✓	✓		✓				✓			✓	
TD816	all lines												
	05												
	06												
	07												
	08												
TD1232	all lines												
	09												
	10												
	11												
	12												
	21												
	22												
	23												
	24												

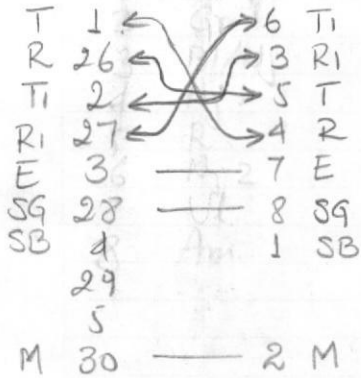
Programming Tables

[811] DISA / TIE User Codes									
Item :		Default		Parameter		Item :		Default	
Code No.	Code	COS	Code (4 digits)	COS (1 - 8)	Code No.	Code	COS	Code (4 digits)	COS (1 - 8)
1	0001	8			17	0017	8		
2	0002	8			18	0018	8		
3	0003	8			19	0019	8		
4	0004	8			20	0020	8		
5	0005	8			21	0021	8		
6	0006	8			22	0022	8		
7	0007	8			23	0023	8		
8	0008	8			24	0024	8		
9	0009	8			25	0025	8		
10	0010	8			26	0026	8		
11	0011	8			27	0027	8		
12	0012	8			28	0028	8		
13	0013	8			29	0029	8		
14	0014	8			30	0030	8		
15	0015	8			31	0031	8		
16	0016	8			32	0032	8		

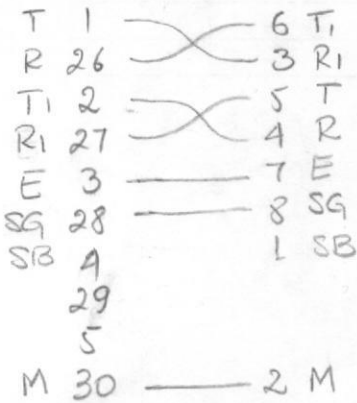
[990] System Additional Information													
AREA 06 [Field 47]													
Field	not used										47	not used	
Default	—	—	—	—	—	—	—	—	—	—	1	—	—
Selection													
<Selection> Field 47 : 0 (enable) / 1 (disable)													

FUNCTIONS

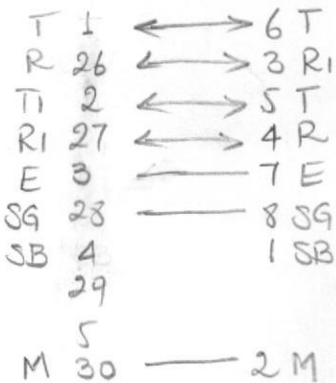
X No
④ Sin SB



X No
⑤ Sin SB



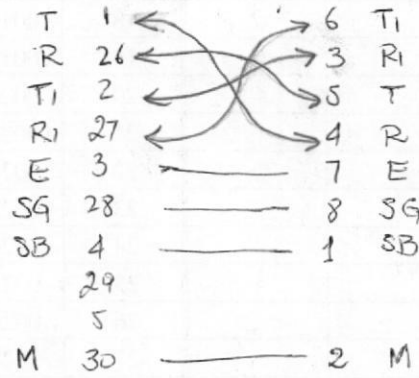
X No
⑥ Sin SB



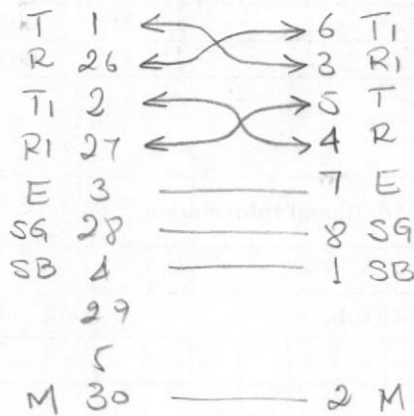
PANASONIC

②

RJ-45



③ X No



① X No



R
Ti
Ri
E
SG
M
SB

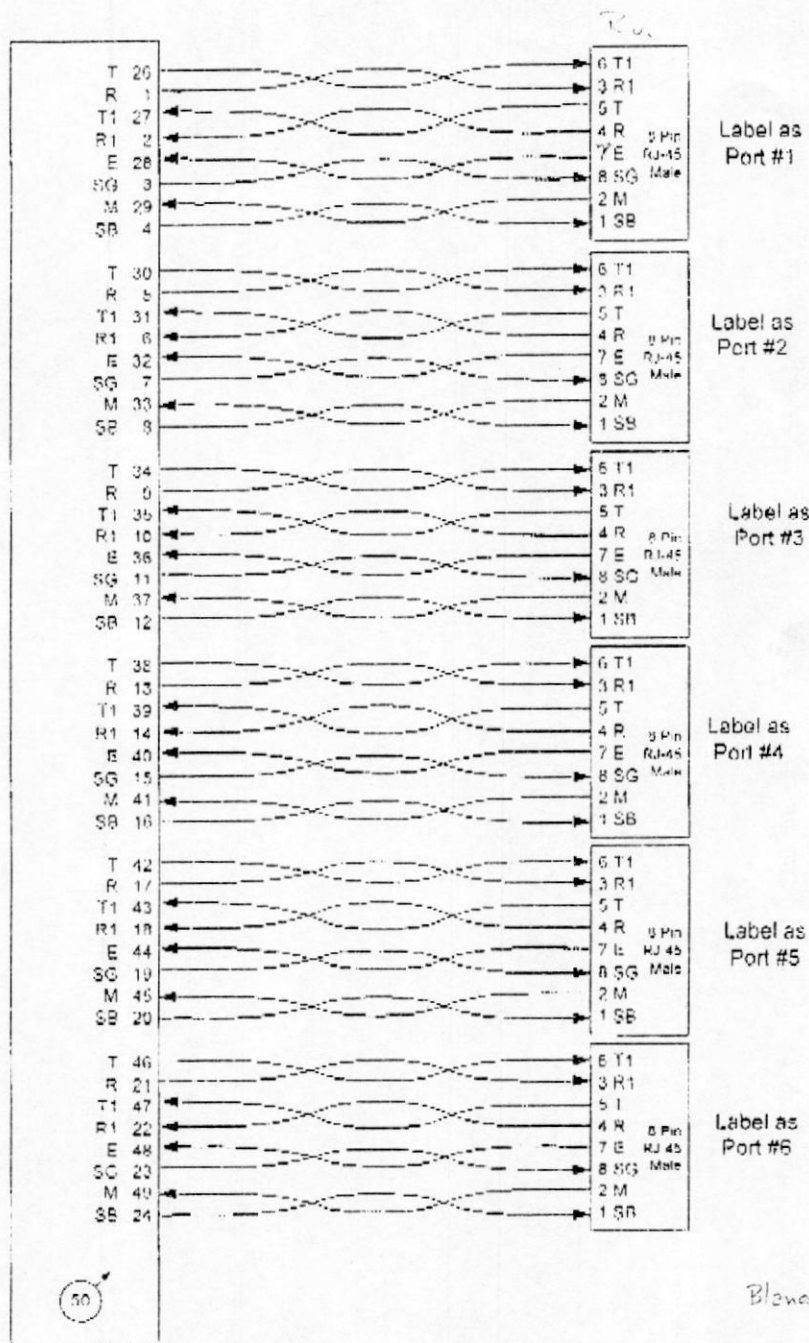
Ri
Ti
R
E
SG
M
SB

Box
7383058

122.112
749 3238

7681

Nortel E&M Voice Cable for Type 2 Signaling

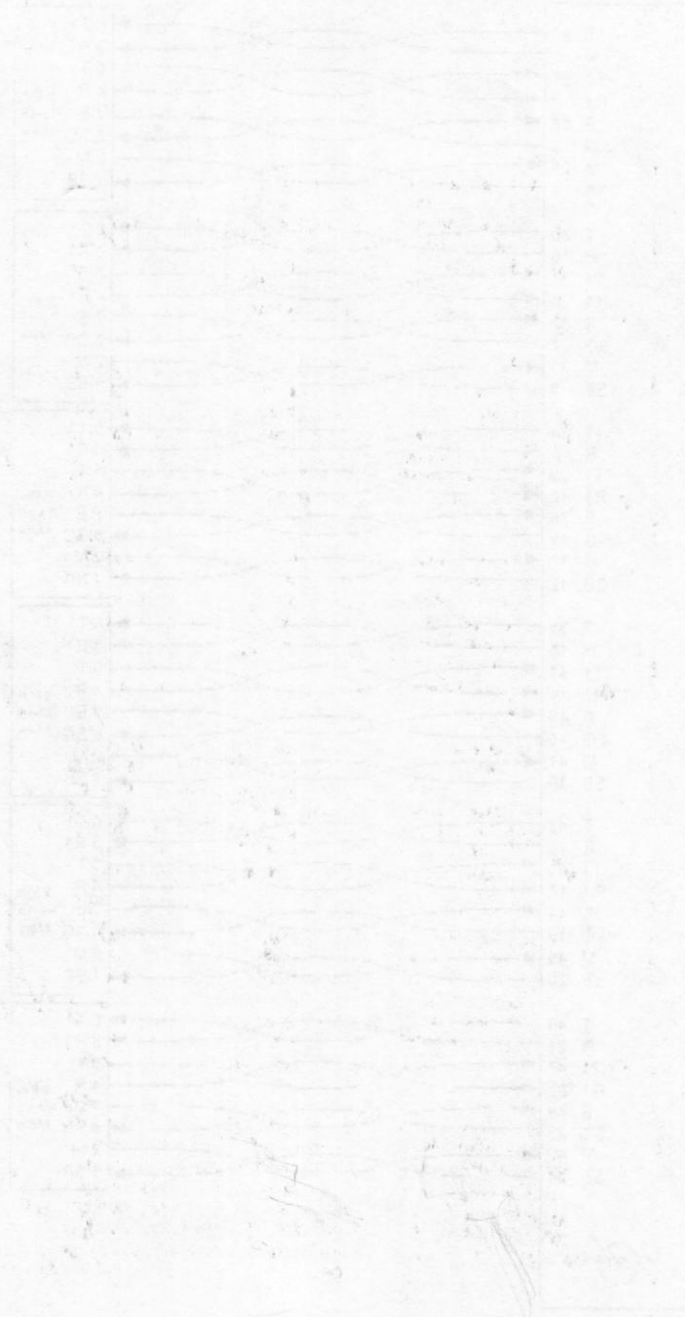


Note:

Total cable length must be 25 feet.
The Main Cable must be bundled to within 18 inches of the RJ-45 legs,
allowing each RJ-45 leg at least 18 inches of free movement.

Blows { 1 - 26 A2
2 - 27 N1
3 - 28 Vd
4 - 29 Ct
5 - 30 gus
Rugs { 6 - 31 A2
7 - 32 N1
8 - 33 Vd
9 - 34 Ct
10 - 35 gus

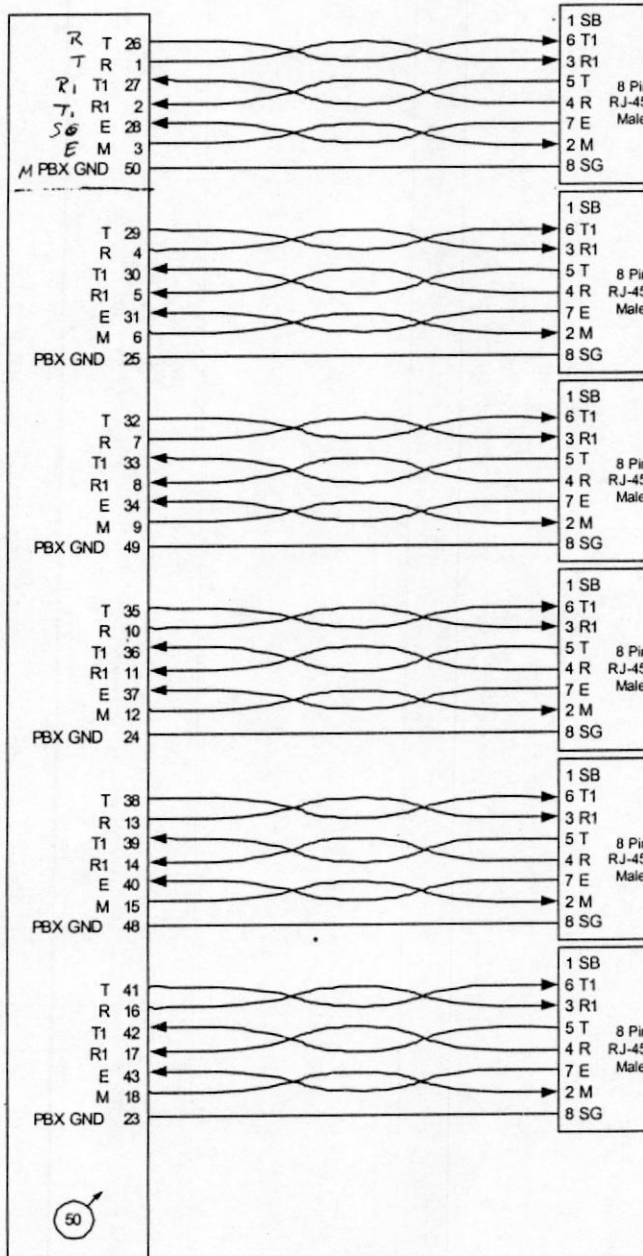
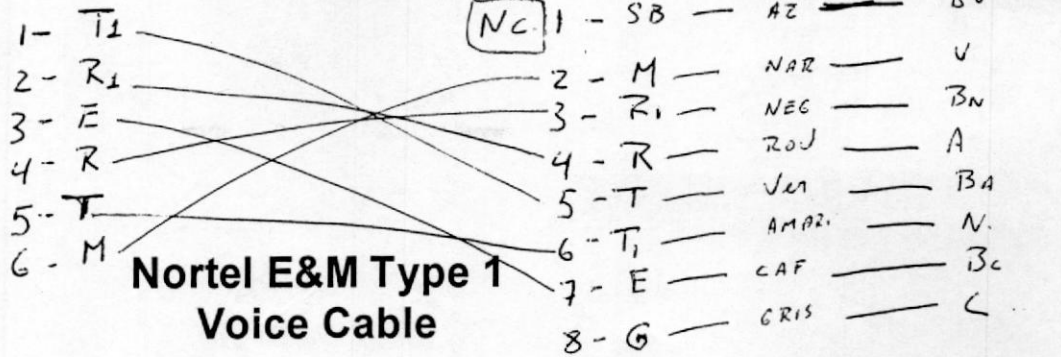
North E&M Voice Cable
Type 2 Signaling



Channel 1
Channel 2
Channel 3
Channel 4
Channel 5
Channel 6
Channel 7
Channel 8
Channel 9
Channel 10
Channel 11
Channel 12
Channel 13
Channel 14
Channel 15
Channel 16
Channel 17
Channel 18
Channel 19
Channel 20
Channel 21
Channel 22
Channel 23
Channel 24

7BX

MERLIN LEGEND



Label as Port #1

Label as Port #2

Label as Port #3

Label as Port #4

Label as Port #5

Label as Port #6

1 BA
A
BC
BN
N
V

Passport
RJ45

1 SB
2 M
3 R₁
4 R
5 T
6 T₁
7 E
8 SG

5-
4 B/C SB
30 G V M
26 A V R
27 N V R₁
2 E/N V T₁
1 B/A V T
3 B/Y V E
28 V SG

Label as Port #5

Label as Port #6

Label as Port #6

Label as Port #6

Label as Port #6

Label as Port #6

A2 26 - 1
27 - 2
28 - 3
29 - 4
30 - 5
31 - 6
32 - 7
33 - 8
34 - 9
35 - 10

Blonde
RJ45

Note:
Total cable length must be 25 feet.
The Main Cable must be bundled to within 18 inches of the RJ-45 legs, allowing each RJ-45 leg at least 18 inches of free movement.

